PS 29M
DUAL CHANNEL BELTPACK
IN METAL CASE

USER MANUAL

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This product is designed and manufactured by:
ASL Intercom BV
Zonnebaan 42
3542 EG Utrecht
The Netherlands
Phone: +31 (0)30 2411901
Fax: +31 (0)30 2667373
E-mail: info@asl-inter.com
Web: www.asl-inter.com

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1.0 GENERAL DESCRIPTION

The PS 29 M is a portable dual channel intercom station. It is housed in a strong metal case provided with a steel belt clip.

On the front panel the unit has, for each channel A and B separately, a Volume (listen level) control, a TALK push button and a CALL push button , both with LED indicators.
On the rear panel are two XLR-3 connectors for the intercom connection cables (two 'party lines') and an XLR-4 headset connector.

As an option an XLR-6 headset connector can be fitted, allowing to hear channel A at the left headset can and channel B at the right headset can ("binaural use").

On the bottom panel are side tone trimmers (one for each channel), a buzzer volume trimmer and a mic gain trimmer.

Special attention has been paid to the intelligibility of speech. By applying low noise / high speed op-amps, a speech presence filter and propriety high power bridged headphone amplifiers, communication is very comfortable even in environments with a high level of background noise.

The unique ASL call system provides both a flashing red LED and a very distinctive sound signal. A momentary push of the Call button makes the red LED flash whilst holding the button for 2 seconds activates the Call sound signal. The volume of this sound signal (the buzzer) can be adjusted at the front panel.

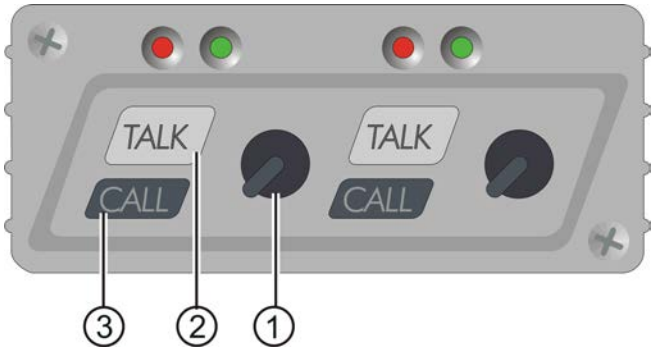
Fully electronic switching increases reliability and allows for 'soft' microphone "on" switching (latched or momentary) and Remote Mic Mute facility

2.0 INSTALLATION

The necessary DC voltages are derived from the intercom master station or power supply, via the intercom connection cables.
To connect the PS 29 M to the intercom system use professional flexible microphone cable with 2 wires and 1 shield only.

The PS 29 M is fully protected against wiring mistakes (reverse power) or short circuit in the interconnecting cables.

3.0 FRONT PANEL CONTROLS



1 VOLUME control knobs

To adjust the listen levels, for each channel separately.

2 TALK buttons

These buttons allow talking to each channel separately or to both channels simultaneously.
If a TALK button is on, its green LED is lit.

Momentary switching:
If a TALK button is pushed and held, the microphone signal is sent to the referring intercom channel until the button is released

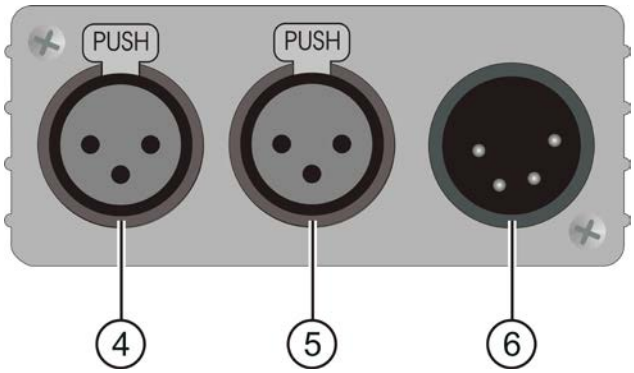
Latched switching:
If a TALK button is pushed shortly it is electronically latched and the microphone signal is sent to the referring intercom channel.
If pushed again the TALK button switches off.

Mic Mute when latched On:
After a so-called Mic Mute signal has been received from a master station or power supply, the connection between microphone and intercom channel is interrupted. By pushing the TALK button, the connection is restored and one can talk to the intercom channel again.

3 CALL buttons

To activate the Call function for the referring party line channel. With a momentary push a Call signal is sent to all intercom stations connected to that channel.The Call LEDs on this PS 29 M and on all stations connected to the same party line start flashing.
By keeping the Call button pushed for 2 seconds the Call Buzzers are activated, provided the buzzers are not muted by a Buzzer Mute signal received from a Pro Series master station or power supply.

4.0 REAR PANEL CONNECTORS



4 LINE connector channel A
5 LINE connector channel B

These XLR-3 connectors are for connecting the PS 29 M to intercom party lines.

Pin assignments:
Pin 1: 0V / ground shield
Pin 2: +30V DC power wire
Pin 3: audio wire

6 HEADSET connector
This XLR-4 connector is for connecting a headset to the PS 29 M beltpack.
The impedance of the headset can must be minimum 200 ohms; in case the headset has 2 cans in parallel, the impedance of each can must be minimum 400 ohms.

Pin assignments:
Pin 1: shield mic. (GND)
Pin 2: mic. +
Pin 3: phones +
Pin 4: phones –

As an option, the PS 29 M can be fitted with a XLR-6 headset connector, allowing to hear channel A on the left headset can and channel B on the right headset can (“binaural use”).

5.0 BOTTOM PANEL CONTROLS

7 SIDE TONE trimmer channel A
8 SIDE TONE trimmer channel B

With the side tone trimmers #7 and #8 one adjusts the level of your voice as you hear in your headset, for each channel separately.
Adjustment procedure:

- Turn trimmer fully clockwise
- Switch the microphones of all (speaker) stations connected to the referring party line channel off
- Activate the Talk function of the referring channel
- Turn up the listen volume of this channel
- Speak into the headset microphone
- Adjust the listen level by turning the side tone trimmer

The operating area of the trimmers is between fully clockwise and minimum level. Adjusting the side tone does not affect the level of your voice as heard by the other stations on the referring party line channel.

9 BUZZER VOLUME trimmer
This trimmer adjusts the volume of the internal buzzer (located behind the front panel). The buzzer is activated when a CALL button on this beltpack (or on any other intercom station connected to one of both party lines) is pushed longer than 2 seconds, provided the buzzers are not muted by a Buzzer Mute signal received from a Pro Series master station or power supply.

10 MIC GAIN trimmer
This trimmer is to adjust the mic gain.
To increase the gain, turn clockwise and to decrease the gain, turn counter clockwise.

6.0 TECHNICAL SPECIFICATIONS PS 29 M

Intercom System
Dynamic range: 80 dB (1 kHz, THD<1%)
Frequency response: 200 Hz - 15 kHz (-3 dB)
Call signal: 2.8 mA
Call signal threshold (receive): +2.4V DC
Operation voltage: 24 – 32 V DC
Power interrupt time (mic mute): 0.1 sec

Intercom Line
Impedance: 350 Ω (1 kHz) / 2.2 kΩ (DC)
Audio level: nom. -18 dBu, max. 0 dBu

Side Tone
Rejection: 0 – 30 dB adjustable

Buzzer
Max. SPL: 85 dBA

Mic pre-amp
Gain: 40 – 60 dB
Presence filter: +6 dB at 5 kHz
Power to electret mic: +9V DC

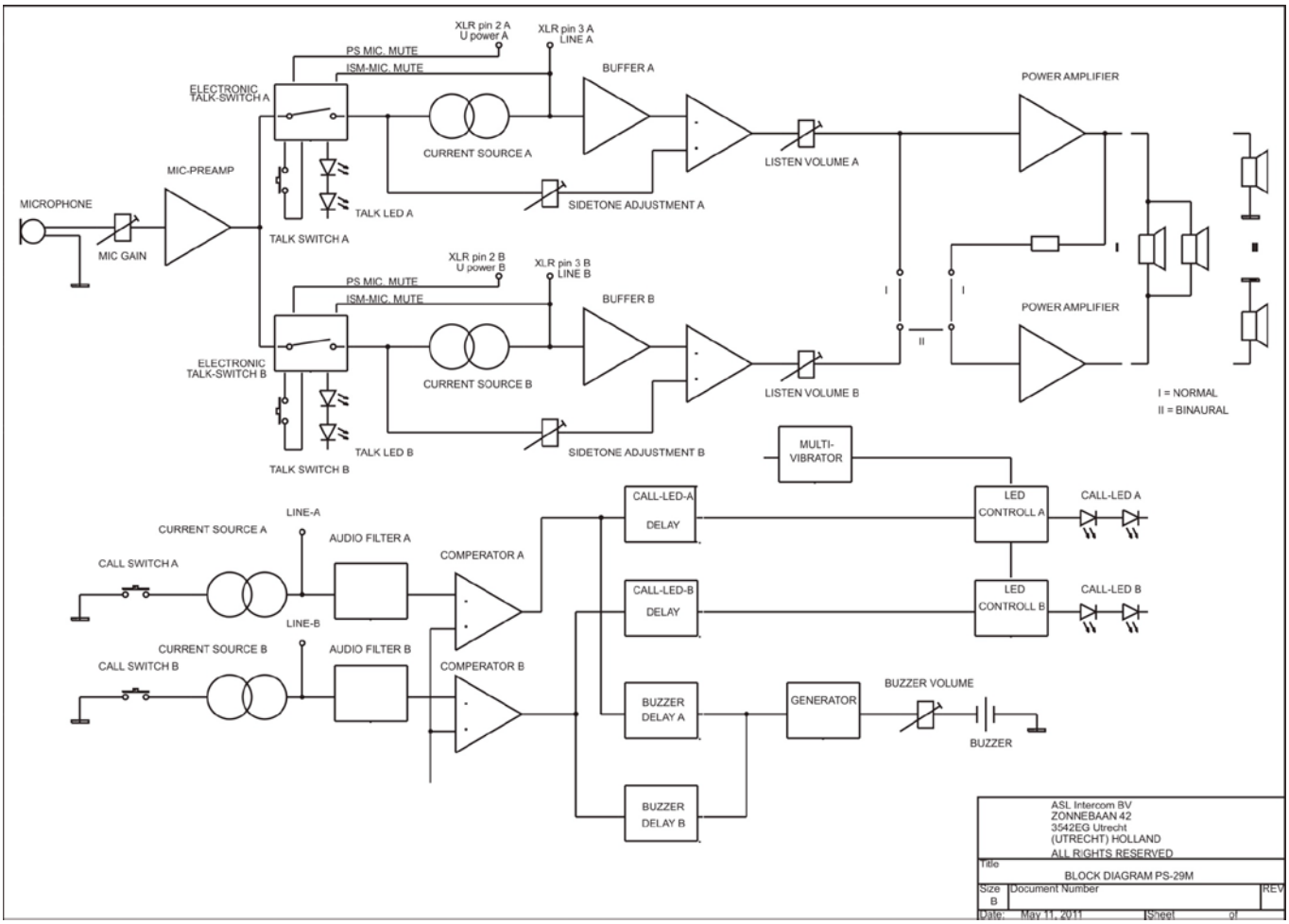
Headphone Driver Amps
Max. load: 200 Ω
Max output level:
monaural: 16 Vrms @ 200 Ω
binaural: 2x 10.3 Vrms @ 400 Ω
Max output power:
monaural: 1.3 Wrms @ 200 Ω
binaural: 2x 0.27 Wrms @ 400 Ω

PS 29 M Power Consumption
Current (at 30V DC):
30 mA quiescent,
45 mA signaling
170 mA at max. output + signaling

PS 29 M Dimensions & Weight
Width: 90 mm / Height: 48 mm (incl. clip)
Depth: 124 mm / Weight: 425 grams

0 dB defined as 775 mV into open circuit.
ASL reserves the right to alter specifications without prior notice

7.0 BLOCK DIAGRAM PS 29 M



8.0 PART LINE, TECHNICAL CONCEPT

User stations in an ASL intercom system are interconnected via one or several 'party lines'
A party line offers two way ('full' duplex') communication and consists of standard microphone (multi-pair) cable. One wire is used for the audio signal and one wire for the DC power. The screen of the microphone cable functions as earth/return.
Current drive is used for signal transfer.
Each intercom station utilizes a current amplifier to amplify the microphone signal. That signal is put on the common audio line.
Due to the constant line impedance, a signal voltage is developed which can be further amplified and sent to headphones or loudspeakers.
(the line impedance is situated in the power supply between XLR pin 3 and pin 1)

This principle has the following advantages:

- The use of a single audio line allows several intercom stations to talk and listen simultaneously
- Due to the high bridging impedance offered by each intercom station. The number of stations on the party line has no influence on the level of the communications audio signal.
- Power and audio to the intercom stations use the same cable

Also the Call signal is sent as a current, on the audio wire. It develops a DC potential over the line impedance which is sensed by each intercom station and interpreted as a Call signal.

9.0 CABLING

The intercom lines (the 'party lines') are of the shielded two-conductor microphone cable type.
The intercom line connectors are of the XLR-3 type. Audio and Call signals are on pin 3. DC power is on pin 2.
Pin 1 is connected to the shield of the cable which functions as the common return for audio and power.

The audio signal is transferred in an unbalanced way (see Party Line, Technical Concept).
To avoid earth loops (hum), the possible effect of electromagnetic fields and to minimize power loss , certain rules have to be obeyed when installing the cabling of an intercom system:

Use high quality cable
Use high quality microphone cable only (shielded two conductor cable, minimum 2x 0.30 mm2). In case multi-pair cable is used, there should be an overall shield and each pair should consist of two conductors (minimum 2x 0.15 mm2) with separate shield.

Use flexible cable
Use flexible single and multi-pair microphone cable instead of cable with solid cores, especially when the cable is subjected to bending during operation or installation.

Cable screens to XLR pin 1
The screen of each separate microphone cable and/or the screen of each single pair in a multi-pair cable, should be connected to pin 1 of each XLR-3 connector. Do not connect these screens to the metal housing of ASL units or XLR-3 wall boxes).
See Earthing Concept.

Connect cable trunks, connection boxes and overall multi-pair cable screens to clean earth
Metal cable trunks, metal connection boxes and overall multi-pair cable screens should be interconnected and, at one point (the 'central earth point') in the intercom network only, be connected to a clean earth or a safety earth (see Earthing Concept).

Keep metal connection boxes and trunks isolated from other metal parts
Metal trunks or pipes for intercom cables and metal connection boxes should be mounted in such a way that they are isolated from any other metal housing or construction parts.

Keep cables parallel as much as possible
When two (multi channel) units in a network are connected by more than one cable, make sure that these cables are parallel to each other over the whole distance between those units. When using multi-pair cable, parallelism is ensured in the best possible way.

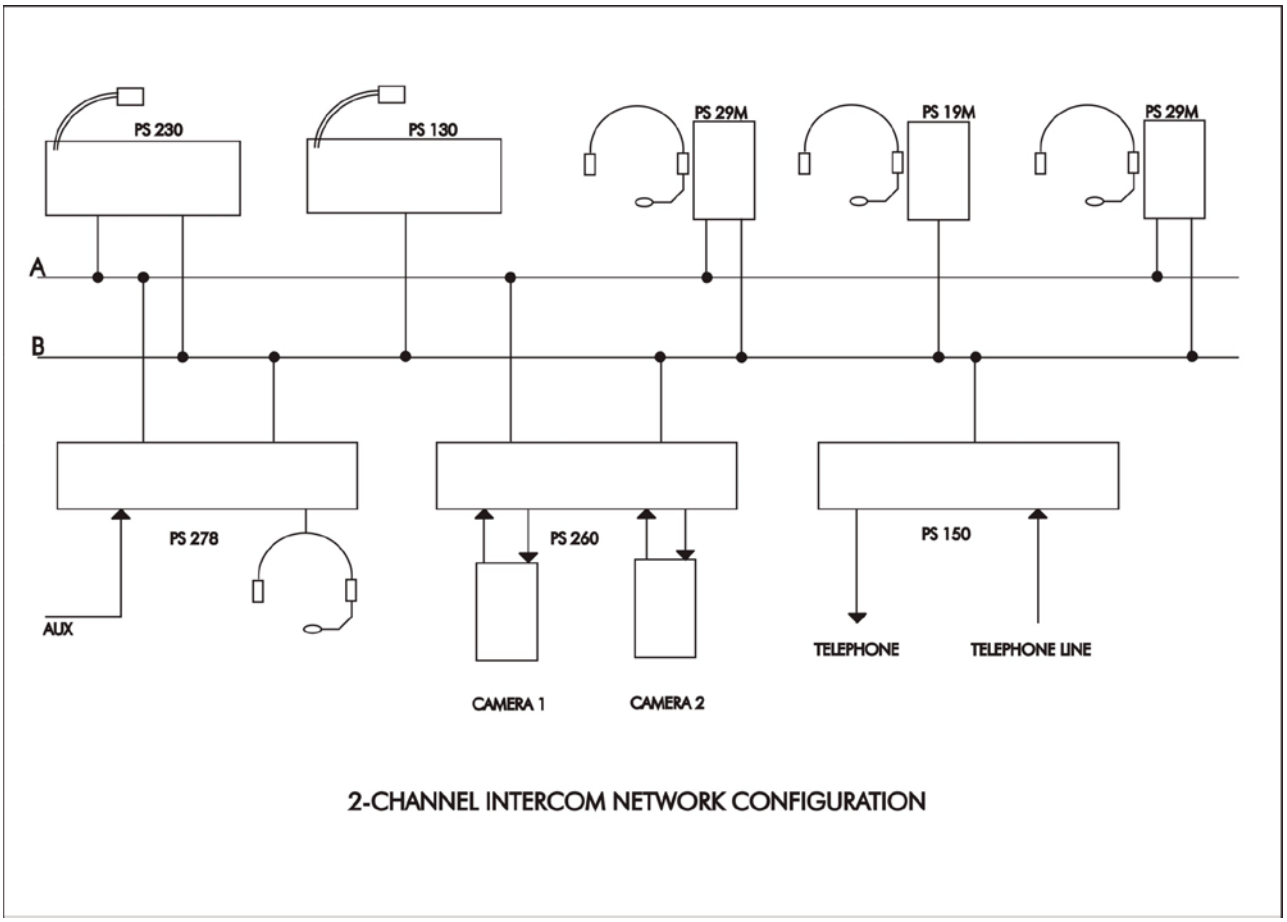
Avoid closed loops
Always avoid that intercom cables are making a loop. So-called 'ring intercom' should not physically be cabled as a ring.

Keep cables away from electromagnetic sources
Keep intercom cables away from high energy cables, e.g. 115/230/400V mains power or dimmer controlled feeds for spotlights. Intercom cables should cross high energy cables at an angle of 90º only. Intercom cables should never be in the same trunks as energy cables.

Place power supply in a central position
In case of a system powered by a separate power supply: In order to diminish power losses, place the power supply as close as possible to where most power consumption occurs, in other words most user stations are placed.

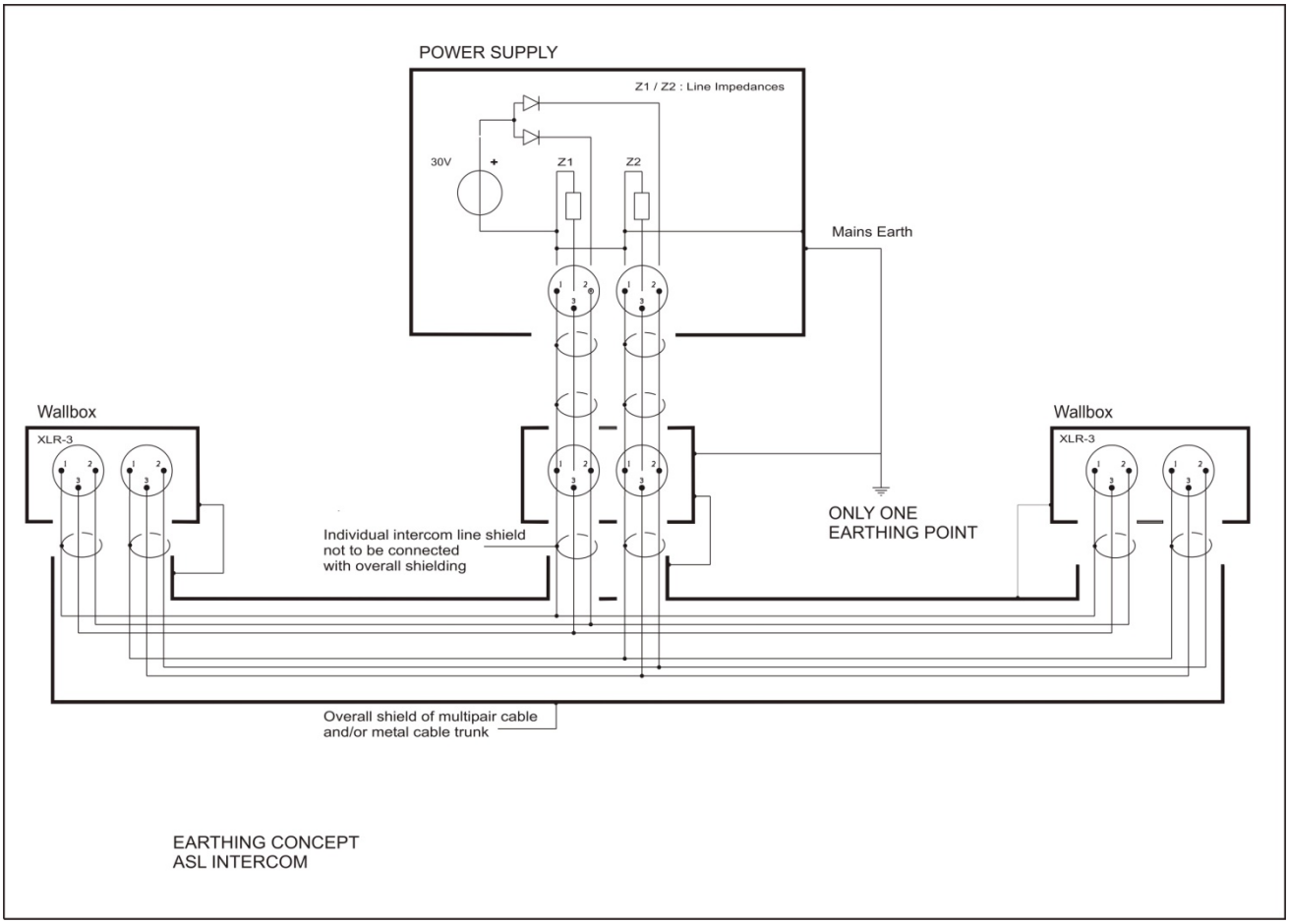
Connect ASL powered units to a 'clean' mains outlet
Master stations or power supplies should be connected to the mains outlet with a clean earth. Other audio equipment may be connected to this mains outlet, but avoid using mains outlets which also power dimmer controlled lighting systems.

10.0 SYSTEM CONFIGURATION



2-CHANNEL INTERCOM NETWORK CONFIGURATION

11.0 EARTHING CONCEPT



EARTHING CONCEPT
ASL INTERCOM